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Structural Monitoring of a Weapons Test Unit Using Dynamic Signature Analysis

by

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ABSTRACT

A methodology to identify structural changes in weapon systems during environmental test is being developed at Lawrence Livermore National Laboratory. The method is coherence based and relies on comparing the “dynamic signature” response of the test article before and after an environmental test or test series. Test caused changes in the dynamic signature get mapped to an image matrix where a color scale represents changes in sensor-to-sensor coherence. This methodology is convenient because an image can present large amounts of information in a very compact form and even subtle system changes may be identified. Furthermore, comparison of the dynamic signature response data “before” and “after” any test event can be made on a quasi-real time basis. This approach is particularly useful on large and/or complex test articles where many sensors are present and large volumes of data are generated.

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